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YEARLY RAINFALL IN THE UNITED STATES.

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(Read before the American Philosophical Society, August 20, 1875.)

At the Society's Meeting, on the 16th of April last, I submitted a communication on the Lunar-Monthly rainfall in the United States, as deduced from an examination of the morning weather maps issued by the Signal Service Bureau. The maps extended over a period of about three years, and as the average number of reporting stations was about sixty, the results represented an average of at least 2000 observations for each of the thirty lunar-monthly days. For various reasons, enumerated in the communication, the derived normals should be regarded as only provisional; still, the regularity of the curve, its magnitude, its resemblance to the Philadelphia curve for 43 years, and the indications of disturbances originating beyond the Mississippi river, seem to justify my estimate of the importance of such general comparisons as our National Bureau has for the first time made possible.

In order to provide still further material for future use, I have tabulated the same observations with reference to Earth's annual course around the Sun. The rainfall for each year is divided into 30 periods of 12 or 13 days each, always dividing to the nearest day, the first division embracing the last six days of one year, and the first six days of the following year. The total fall for each period was divided by the total number of reports for the same period, and the normals were deduced from the resulting averages in the same manner as in my previous meteorological papers. These normals, as given in the accompanying table, indicate an average solar disturbance about 2.3 times as great as the lunar. This suggests some kind of *reciprocal* tidal action, and it seems also to point towards an important cosmical law, but more extended observations and comparisons are needful in order to justify any conclusive decision. There are some resemblances between the present curve and the corresponding lunar-monthly curve which seem worthy of study, but it is perhaps better to postpone their critical examination, until their significance is either confirmed or changed by the observations for one or more additional periods of like duration. For the convenience of those who may desire to make comparisons without waiting for further data, I copy the lunar normals alongside of the solar.

Yearly and Lunar-Monthly Rainfalls in the United States, from Observations of the Signal-Service Bureau for Three Years :

Solar Yr. + 30.	Average.	Normals.	Normal Per Cent.	Lunar Day.	Normal Per Cent.
1	.046	591	95	1	100
2	.024	531	85	2	96
3	.033	504	81	3	94
4	.032	526	84	4	92
5	.036	548	88	5	96
6	.034	552	89	6	103
7	.035	549	88	7	111
8	.032	554	89	8	107
9	.039	558	90	9	97
10	.032	543	87	10	89
11	.033	518	83	11	87
12	.031	507	81	12	88
13	.029	519	83	13	87
14	.041	520	83	14	87
15	.024	494	79	15	93
16	.031	493	79	16	98
17	.033	551	88	17	96
18	.038	647	104	18	97
19	.053	739	119	19	107
20	.044	807	129	20	116
21	.060	848	136	21	119
22	.053	840	135	22	114
23	.047	785	126	23	107
24	.050	708	114	24	104
25	.031	681	109	25	104
26	.043	776	124	26	99
27	.076	849	136	27	95
28	.040	746	120	28	100
29	.030	618	99	29	113
30	.039	602	97	30	106

It seems desirable that similar tables should be constructed, to indicate both the solar and the lunar influence, for each of the other daily reports to the Bureau. The final returns to the office are probably much more complete than those given on the maps, and their indications would perhaps be more satisfactory.